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Influence of hydrothermal treatment conditions on the structure and catalytic activity of alumina during the skeletal isomerization of n-butenes

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Abstract

In order to obtain an efficient alumina catalyst for skeleton isomerization of n-butenes with a high catalytic activity, we study the influence of hydrothermal treatment (HTT) of alumina systems at 150- 200°C on the parameters of the crystalline and pore structure, and acid-base properties of industrial ?- Al 2O 3. It is shown that the HTT of aluminum hydroxide increases the sizes of microcrystallites and reduces the alumina's specific surface area and the number of acid-base centers. This reduces the activity in the reaction of skeletal isomerization of n-butenes. HTT of the two-phase alumina-aluminum hydroxide sys- tem produces smaller crystallites of γ-Al 2O 3 and raises the acidity of the alumina obtained after calcination at 550°C; as a result, the catalytic activity increases. This method can be used to enhance the activity of industrial samples of alumina in the reaction of skeletal isomerization of n-butenes. © Pleiades Publishing, Ltd., 2012.

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Keywords

Alumina, Butenes, Hydrothermal treatment, Skeletal isomerization